Massachusetts Industry Projections

An analysis of industry employment to 2005

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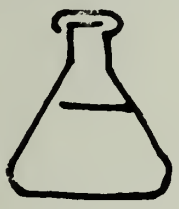

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Department of Employment and Training

Commonwealth of Massachusetts

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Department of Employment and Training

Massachusetts Industry Projections: 1991-2005

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Introduction: Interpreting and Using the Projections

This report is the first of a two-part series examining Massachusetts' long-term job outlook. It analyzes industry growth--the changes in demand for workers by industry. It also provides job projections for approximately 150 industries and insights into the factors affecting future industry employment. Also examined is the impact of these projected employment changes on education and training in an increasingly competitive job market.

These projections are designed for use by career counselors, educators, business planners, policy makers and others who need long-range information on employment trends. Industry projections and detail employment data are also widely used by university researchers, other government agencies, trade and professional associations and businesses for market research, industrial analysis and other economic impact studies.

A companion report, due to be issued next spring, will provide job projections by occupation. This occupational report will identify the number of job opportunities projected to arise from new demand and replacement needs.

The projections cover the 14 year period from 1991 to 2005. They are not and cannot be precise forecasts, but instead are indicators of the relative size, general direction and likely future direction of employment within the state's economy. Although each growth rate suggests a straight line trend or a constant rate of change between 1991 and 2005, the percentage generally incorporates the cyclical fluctuations common to most industries, which over the long-term, should reflect the dominant trend for each industry.

Key Assumptions Underlying Massachusetts Job Projections

Key assumptions that form the basis of the projections are as follows:

- Massachusetts' job growth will continue to be concentrated in jobs requiring more education. The proportion of the state's 25+ population having a college education rose from 20 percent in 1980 to 27 percent in 1990 and should continue to rise over the projection period. Only 20 percent of the U.S. population 25+ had completed at least four years of college in 1990.

- Unemployment is estimated to average 5.5 percent at the end of the projection period, the same as the nation.

- Population growth in Massachusetts is projected to average 0.3 to 0.4 percent per year over the decade, slower than the 0.5 percent yearly growth between 1980 and 1990. U.S. population growth is expected to be at least twice as high through the projection period.

- The age distribution of Massachusetts' population is expected to change markedly. In 1975, 10-19 year olds made up the largest segment of Massachusetts' population; by 1990, 25-34 year olds comprised the largest age group; and by 2005, 40-49 year olds should constitute the largest age group.

- Massachusetts' work force will age dramatically. Population aged 16-44 is projected to decline nearly ten percent from 1990 to 2005, while population aged 45-64 is expected to rise over 40 percent.

- The growth of minority groups will continue to be a most notable feature of the state's changing population. Primarily because of their higher historic birth rates and immigration, minorities will continue to grow faster than other demographic groups and account for an increasing share of Massachusetts' working-age population.

- The Massachusetts labor force is expected to grow at well under a 1.0 percent annual rate. Between 1975 and 1990 the Massachusetts labor force grew at a 1.1 percent annual rate. The U.S labor force is projected to expand at a 1.3 percent rate between 1990 and 2005.

- Key national assumptions about U.S. economic growth, productivity, the deficit, and defense spending are derived from the U.S. Bureau of Labor Statistics' moderate-growth projections: 1990-2005.

Overview: A Summary of Past and Projected Employment Changes

Between now and the beginning of the next century, the Massachusetts economy should generate 419,000 new jobs. The projected 15 percent growth is half the annual pace set between 1975 and 1990. This marked slowdown results from the state sharing in slower growth nationwide; changing demographics, most notably the aging of the labor force; and the impact of the current economic recession.

Although many industries will recover from their 1991 employment levels, the long-term job outlook varies significantly among industries.

In the eighties, the Massachusetts economy moved from an industrial base to services. This trend will continue as almost all of the new jobs projected to occur are in the service-producing sector of the economy--services; wholesale and retail trade; finance, insurance and real estate; and transportation, communications and utilities. However, increasing competition, deregulation and improved technology should enhance service sector productivity and may temper job growth.

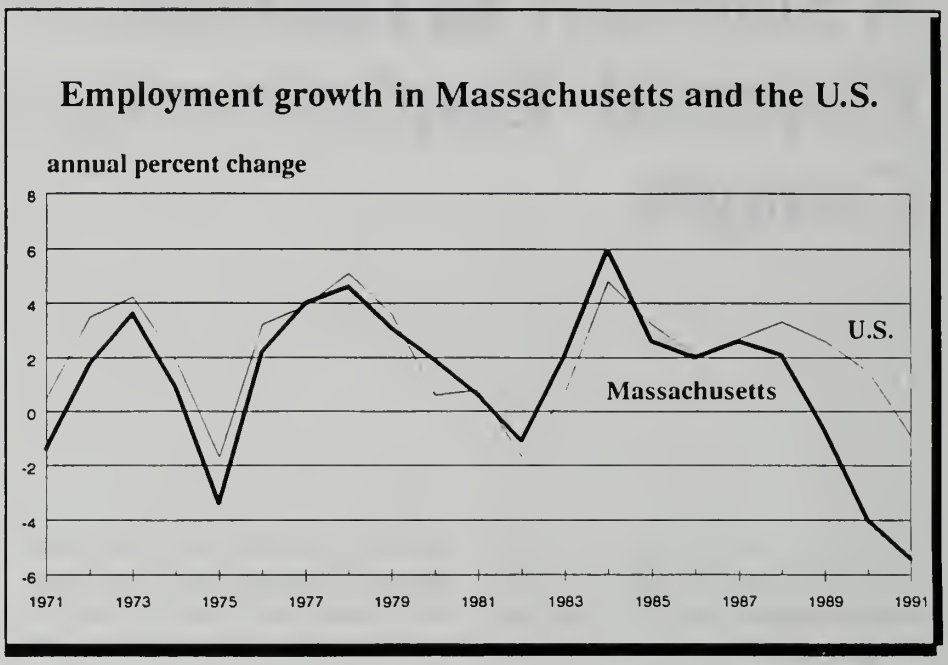
With a projected 31 percent growth rate, services is the only division projected to grow significantly faster than the average growth rate for all industries, adding more than two-thirds of the state's total job growth. Massachusetts is uniquely positioned in terms of the high education and skill requirements of its service industries. Nearly half of all service division jobs in the state are held by professional, technical, and managerial workers. The two largest industries in services--health and business services--together account for over 50 percent of the projected increase in service industry jobs. Eleven of the 15 projected fastest growing industries described in the next section are service industries.

Projected Employment Changes by Sector

	Employment 1991	Employment 2005	Net Change	Percent Change
Total	2,817,500	3,236,400	418,900	14.9
Service-producing sector	2,252,300	2,703,000	450,700	20.0
Services	892,900	1,171,000	278,100	31.1
Wholesale and Retail Trade	649,600	748,300	98,700	15.2
Finance, Insurance & Real Estate	201,200	229,200	28,000	13.9
Transport, Commun & Utilities	124,200	136,100	11,900	9.6
Government	384,400	418,400	34,000	8.8
Goods-producing sector	565,200	533,400	(31,800)	-5.6
Construction	79,300	100,800	21,500	27.1
Manufacturing	484,700	431,400	(53,300)	-11.0
Mining	1,200	1,200	0	0.0

Massachusetts employment growth:

- lagged behind the U.S. in the 1970s;
- surpassed the U.S. in the early 1980s;
- and declined faster than the U.S. in the late 1980s



Rapid industry restructuring in the 1980s led to a movement of jobs from the goods-producing industries to the service producing-industries. By 2005, goods-producing industries will account for only 16 percent of all jobs, down from 20 percent in 1991 and 28 percent in 1980.

Jobs in the goods-producing sectors--construction, manufacturing, and mining--will decline in total. Job gains in construction will not be enough to offset the job losses in manufacturing. Overall employment in manufacturing is projected to fall by 53,000 jobs. Continued rapid growth of imports and a reduction in defense spending will contribute to the decline.

Longstanding Trends in Labor Force and Population Growth

Growth in demand stems in large part from the growth of the labor force. This drives the demand for consumer goods and services, business investment, government purchases of goods and services and imports and results in job growth in industries and occupations.

Between 1980 and 1990 Massachusetts' labor force (i.e., everyone employed or looking for work) grew about ten percent, compared to 17 percent for the U.S. Women accounted for much of the growth in both the state and the U.S., but in Massachusetts women made up an even greater percentage share--78% vs 62%. Over the projection period, labor force growth will slow, largely the result of the slowdown in the working age population, but also a result of a slower growth in female labor force participation rates. On the other hand, the gradual decline in male labor force participation rates will probably abate.

While the labor force as a whole is projected to grow more slowly than in the recent past, the growth of the minority population will continue to be a most notable feature of the state's changing labor force composition. Primarily because of their higher historic birth rates and immigration trends, Hispanics and Asians will continue to grow faster than other groups and account for an increasing share of the labor force. The higher concentration of women and minorities will increase the diversity of the Massachusetts workforce and promote new economic opportunities and markets for business.

The decline in the teenage workforce will end during the projection period. Consequently, the shortage of entry workers that many employers felt in the late 1980's should be less apparent over the 1991-2005 period.

Massachusetts' birth rates have been consistently lower than the nations'. One reason for Massachusetts' low fertility rate is that Massachusetts' working age

women have historically been more likely to be active in the labor force than their national couterparts. As a result of the low birth rates of the mid 70's, the Massachusetts economy had to absorb fewer 16 year olds into its labor force. The state's fertility rates should gradually rise but will still trail the nation's.

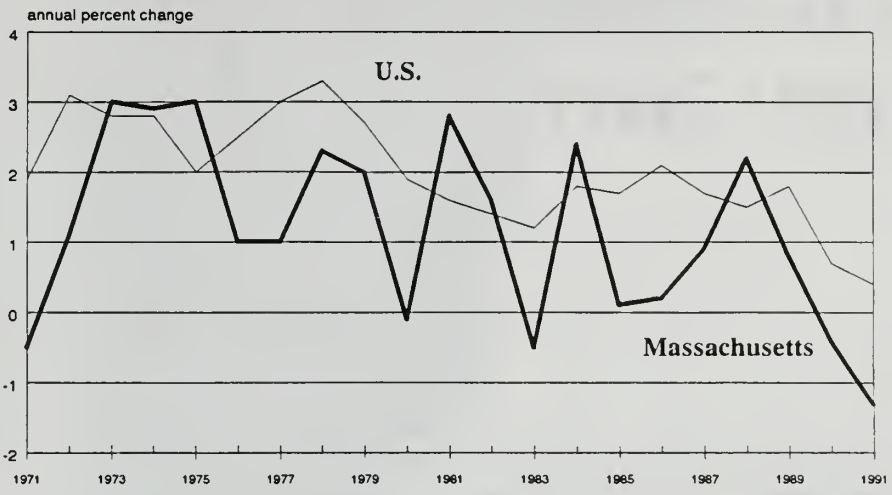
From 1970 to 1980 Massachusetts population expanded less than one percent. In the eighties, Massachusetts population increased 4.9 percent, but this rate was still only half the national increase. The state's projected 1990-2000 population growth should slow to 3.7 percent.

The Importance of Education in the Emerging Job Market

This projected economic slowdown does not mean that overall job prospects will be different from previous periods. Although technology will continue to change the structure of employment and how work is done, more and more businesses will require employees with greater interpersonal and analytical skills. While Massachusetts has historically had more than its share of highly educated and skilled workers, it is necessary to maintain this quality work force to keep its competitive advantage and meet future demand.

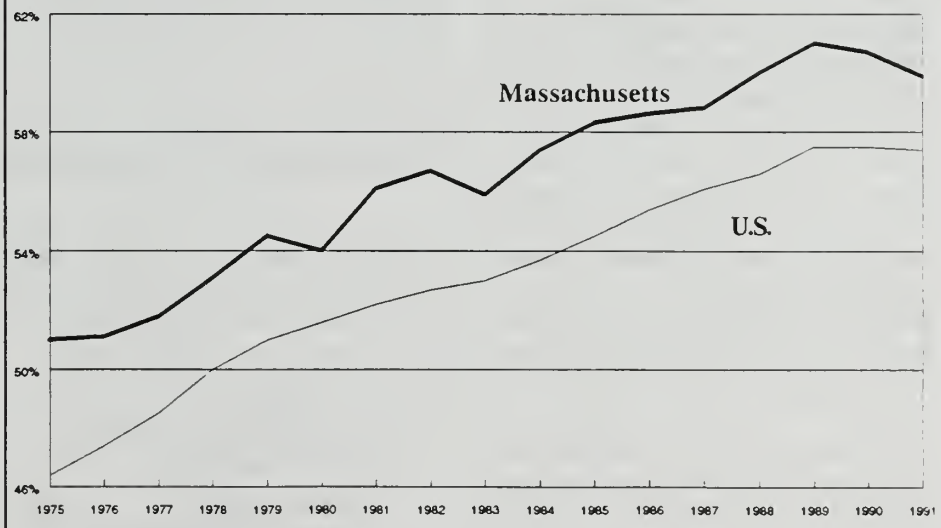
Although unemployment rises and falls for all educational groups over the course of a business cycle, workers with more education have, on average, lower unemployment rates and higher earnings than workers with less education. In short, workers with the most education and training will have the best opportunities for obtaining employment in the projected job market, even when such employment may not totally match their job skills.

Labor force growth in Massachusetts continues to lag U.S. growth



Women in Massachusetts have historically been more active in the labor force than their U.S. counterparts

(the number of women in the labor force expressed as a percentage of the working age population)



The Largest and Fastest Growing Industries in Massachusetts: 1991-2005

Certain industries are projected to grow more rapidly than others, while some are projected to grow slowly but add large numbers of new jobs. The following sections identify both the largest and fastest growing industries over the period and some of the factors driving their growth. All of industries in both rankings are in the service-producing sector.

Improvements in productivity have helped to keep the number of jobs in the goods-producing sector from rising as fast as demand. Consequently, industries in this sector did not meet the above criteria. It is important to note, however, that while many industries in the goods producing sector are projected to lose jobs, particularly in manufacturing, this does not imply that these industries are disappearing. Some of the fastest growing industries in terms of output are in manufacturing.

It is also important to remember that while job growth within the industry sectors varies significantly, hiring activity does not stop completely. Even in slow growing and declining industries, some firms are always hiring.

The Fifteen Fastest Growing Industries

The chart on the following page shows the 15 fastest growing industries in Massachusetts. Anticipated growth rates of 30 percent or more were the primary criteria in compiling the list. All 15 of the industries are in the service-producing sector and four are also projected to account for the greatest growth in jobs over the period (see page 9).

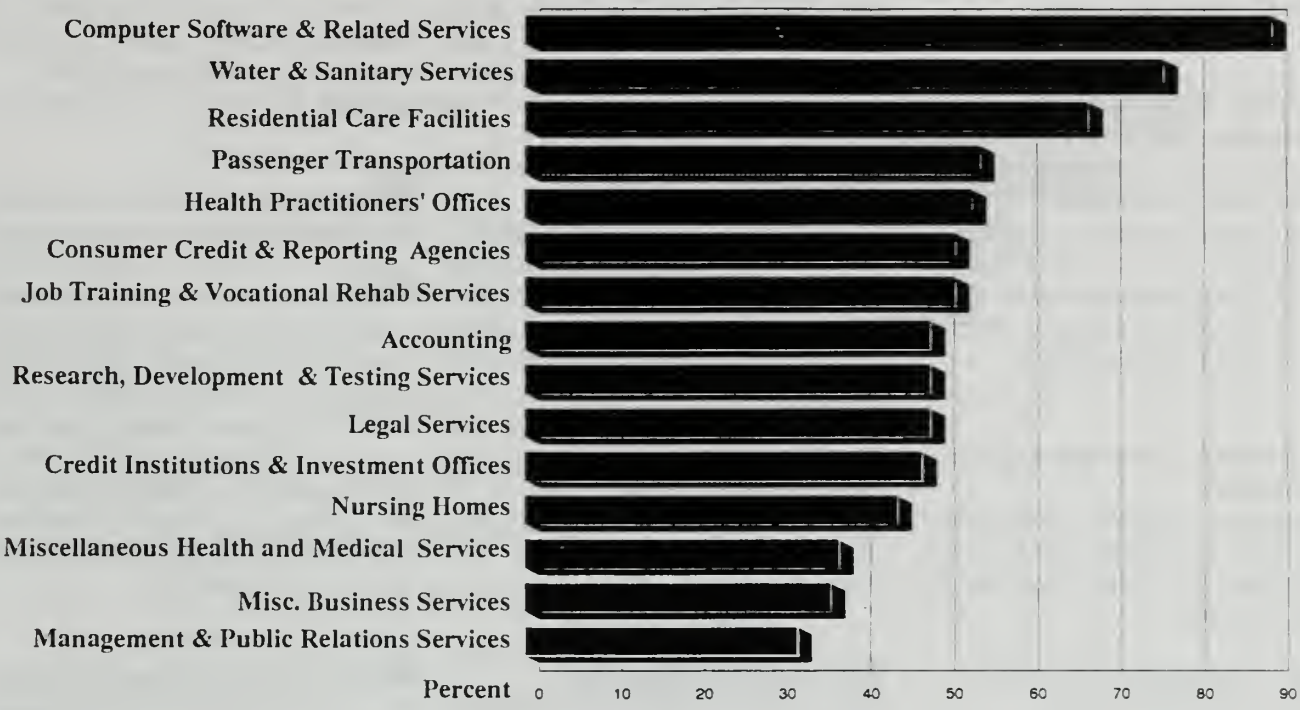
■ **Computer Software and Related**
This industry is projected to grow the fastest and generate the largest number of the state's jobs over the projection period. By 2005, employment is expected to rise 90 percent and generate 36,000 new jobs. This strong growth is slower than past rates but its top ranking is attributable to the cutting-edge nature of the firms that comprise the industry and the continuing demand for computer services worldwide.

Tips on How to Interpret the Projections

The Massachusetts economy is projected to grow 14.9 percent between 1991 and 2005. This is the average growth rate for all industries. Certain industries, however, will grow faster than this; other will increase more slowly or decline. The following chart explains these terms.

Term	Rate of Change
Much faster than average	31% or more
Faster than average	20% to 30%
Fast as average	11% to 19%
Slower than average	4% to 10%
Little change	-3% to 3%
Decline	-4% or more

Fastest growing industries in Massachusetts: 1991-2005



Firms in this industry provide a wide variety of programming; data processing; networking; and consulting services such as the design and selection of software, hardware, telecommunications linkages, and database management. Computer programming and software accounts for the largest number of jobs within this industry (35 percent), followed by data processing (23 percent) and networking (22 percent). In 1991 the computer software and related service industry employed about 40,000 workers and paid an annual average wage of $46,200.

All segments of this large industry are projected to continue their faster than average growth rates. The increased use of personal computers, for example, should continue to create new markets for local area networks, electronic bulletin boards and customized programming services. The downsizing of computer operations in favor of smaller personal computers will continue to drive the demand for software and other programming services. As software becomes increasingly price competitive, however, firms specializing in this area will continue to consolidate.

The purchase of outside data processing service operations continues to be cost effective and job growth within this segment should continue to be strong. The prime markets for this type of outsourcing include banking and financial services, health care and government.

Water and Sanitary Services

Firms in this industry supply water, clean up hazardous waste such as oil spills, and remove and dispose of sludge. In 1991, nearly 345 Massachusetts firms employed over 5,000 workers in this field and paid an average annual wage of $33,600. Increased emphasis on the importance of environmental quality underlie the projected high growth rate for these services.

Residential Care Facilities

These firms provide live-in and social and personal care services for the aged, people with special needs and teenage law offenders. They include alcohol and drug rehabilitation centers, foster homes, halfway houses, and rest homes. Increases in the need for care of an aging population, the homeless, and troubled youth are reasons for this projected growth.

Passenger Transportation Arrangement
Travel agencies, tour operators and airline ticket agencies are just some of the firms included in this industry. Business and pleasure travel should continue to increase as incomes rise and more people retire, and use travel agents to make their plans.

Health Practitioners' Offices
Employment in offices of doctors dentists, chiropractors, optometrists, therapists and other health fields is expected to rise rapidly. As the population ages and more and more health services are required, many procedures will be performed in offices and group practice centers, rather than hospitals.

Consumer Credit and Reporting Agencies
Businesses are expected to make greater use of these types of services to collect fees, adjust claims, and report and investigate credit.

Job Training and Vocational Rehabilitation Services
Providing counseling, training, and rehabilitation services to out of school youths and the unemployed should be in great demand in an economy reshaped by technology.

Accounting
The continued complexity of tax laws, risk management and reporting requirements will increase business expenditures for accounting, auditing, and bookkeeping services.

Research, Development and Testing Services
This industry includes research and development labs and other commercial and noncommercial research organizations that test or develop products on a fee or contract basis. Industry and government spending on research and development is expected to continue to be significant. Tax incentives for firms involved in research and development, and greater cooperation among industry, government and college and university research also should stimulate this growth.

Legal Services
The growing complexity of laws, import/export restrictions in an expanding global economy, and increases in the number of prepaid legal service plans should stimulate jobs for lawyers, paralegals, and other legal service workers.

Credit Institutions and Investment Offices
This industry is comprised of investment and other finance companies such as mortgage associations, business credit institutions, and personal loan services. Although the unprecedented growth of this industry in the 1980s will not be sustained, slower but steady growth is anticipated. As the population continues to age, there will be more people with higher incomes and lower expenses who will want to invest for their retirement.

Nursing Homes
Consistent with an aging population is the projected demand for nursing and personal care services. Convalescent homes and rest homes as well as long-term care facilities are included in this large industry.

Although many nursing homes and home health care agencies currently have difficulty attracting skilled health care workers, this situation should improve as new workers gradually enter this industry. By 2005, nursing homes are expected to employ over 80,000 workers.

Misc. Health and Medical Services
This industry includes home health care agencies, the visiting nursing association, health maintenance organizations, home health care agencies, medical and dental labs, blood banks, kidney dialysis centers and other health related service firms. The growing elderly population and the trend to provide more care on an outpatient basis, both will stimulate the growth of health maintenance organizations, and increase the demand for home care services.

Miscellaneous Business Services
This large industry encompasses detective and security guard agencies, film processing centers, telephone

The Computer Software and Related Services Industry in Massachusetts

Market Segment *(1991 Data)*	# Firms	Employment	Average Annual Wages
Programming Services	378	5,400	$45,800
Software	586	8,400	$50,200
Integrated Systems Design (networking)	216	8,700	$54,600
Data Prepartation & Processing	217	9,000	$34,100
Information Retrieval Services	39	400	$39,500
Facilities Management Services	23	600	$41,700
Rental and Leasing	40	500	$41,400
Maintenance and Repair	145	2,700	$45,400
Service, not elsewhere classified	646	4,200	$49,600
Total	**2,290**	**40,000**	**$46,200**

Industries generating over 50 percent of the projected new jobs in Massachusetts: 1991-2005

answering services and other business services, not elsewhere classified. Business, government and consumers will continue to purchase and improve security systems. However, growth will not be as rapid as in the past, particularly for security guards.

Management and Public Relations Services

This industry provides four basic types of services: management and administration (business and facilities management and administration); public relations (including lobbyists); management consulting (marketing, personnel, and administrative consulting); and economic, research and other consulting services. In 1991 it had a payroll of 26,600 workers, many of whom are accountants, economists, engineers and public relations specialists. Businesses will continue to contract for these highly specialized services, especially for market research, efficiency experts, personnel training, and systems design.

Large industries in Massachusetts: 1991-2005 Job Outlook

The chart above identifies the ten industries generating the most new jobs. As a group, these ten account for over 50 percent of Massachusetts' projected total job growth. Four of these large industries--computer software and related services; health practitioners' offices, nursing homes and legal services also appear in the fastest growing ranking. Although the other six are projected to grow about as fast as the average for all industries, due to their large size--hospitals alone employ 129,000 workers--they are projected to add large numbers of new jobs.

Industry Growth: 1991-2005

Service Sector Job Outlook

Industry Profile and Projections
Service division establishments provide individuals, businesses, government, and other organizations with a wide range of services that include health, education, accounting, engineering, business, hospitality, and personal services.

It is both the largest and fastest growing division within the service-producing sector accounting for the bulk of the state's job growth in the eighties.

Although many service industries in the 1990s will restructure, employment should increase 31 percent to 1,171,000 jobs by 2005, accounting for two out of three new jobs. The sector will indeed be the key to Massachusetts' economic future.

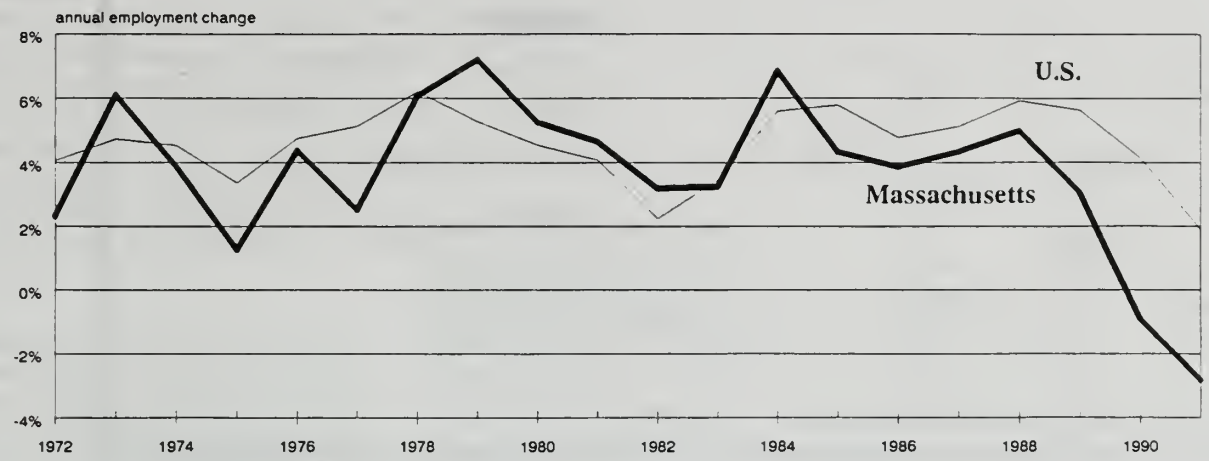
Service industries are projected to account for twelve of the state's 15 fastest growing industries between now and the beginning of the next century. Job growth in health services, the largest service, will account for 31 percent of the projected new jobs in this sector. In fact the fields of medicine, education, and business services are export industries in Massachusetts, and a strong presence in these areas bodes well for Massachusetts' economic future. It is expected that the many hospitals, high tech firms, colleges and universities in our state will continue to send new discoveries out to the rest of the nation and the world for many years to come.

Recent Trends
Comprised of a wide range of business and consumer services, this sector represents the most important source of employment in Massachusetts. In 1970, one out of five jobs in Massachusetts were in service industries. By 1980 almost one quarter of the jobs were in services and by 1990, nearly one out of three. From hotels to hospitals and from social services to software development, this diverse group of industries provided over 85 percent of Massachusetts' net job growth in the eighties. The sector is still expected to account for two out of every three new jobs between now and 2005.

Explaining Rapid Growth
Much of the growth in services is the result of increased demand coupled with the historically slow growth in service sector productivity. As the economy grows and profits and incomes rise, businesses and consumers spend proportionately less on goods and more on services, thus spurring growth. While difficult to measure in some service industries, overall productivity in services has lagged behind productivity in the economy as a whole. A rise in demand for services combined with lower productivity contributed to increase the number of service sector jobs.

Between 1989 and 1991, however, Massachusetts lost 34,200 services jobs, the first time that service industries lost jobs since 1972. All service industries except health care declined. Even business services, which had grown rapidly during the eighties, fell markedly in the 1990 downturn, as the demand for advertising, services to buildings and personnel supply services softened.

Much of the growth in services in the 1980s was the result of increased demand for services coupled with the historically slow growth in service sector productivity.



U.S Trends

In the U.S., service industries expanded more rapidly than in Massachusetts, but accounted for only about half the U.S. total job growth over the decade compared to over 85 percent of the state's job growth. U.S. job growth in the eighties was slightly lower than that recorded in the seventies. In 1991, the U.S. job growth rate weakened but not as much as in Massachusetts. Nationally, only about one out of four jobs are in service industries.

Job Outlook by Industry

By 2005, service industries should account for 36 percent of the state's jobs and twelve of the 15 fastest growing industries. Over the decade, however, growth of many service industries will slow, the result of slower population and labor force growth and the maturing of high tech services.

The exception will be the health industry, the largest component of the service division and indeed of the Massachusetts economy. Health services will continue to expand steadily to meet the needs of an aging population. Many jobs in health services, especially in nursing, will continue to be among the fastest growing. Helped by economies of scale, and the presence of so many highly specialized colleges and universities, Massachusetts should continue to retain its leadership in software development, and medical and scientific research. With continued advances in software, medicine, and biotechnology, Massachusetts should maintain its strong global position in these industries of the future.

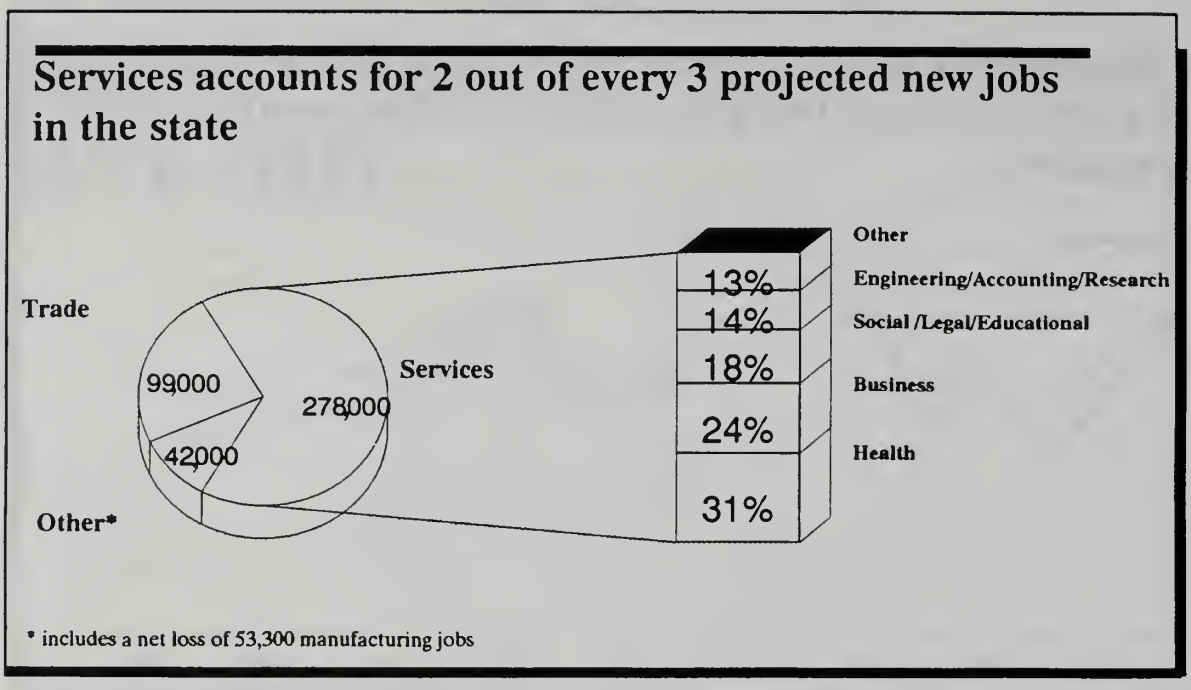
Business and Management Services

Business and management services include industries that range from computer and data processing services to personnel supply services. They include many high tech or high skill oriented industries such as engineering, accounting, advertising, research and testing, and management consulting.

Demand for business, engineering, accounting, research, and management services is projected to increase 45 percent and generate 105,000 new jobs between 1991 and 2005, comprising 38 percent of the growth in services.

Business services expanded rapidly during the eighties, doubling its employment base. Many businesses contracted for some services previously performed in-house, such as computer and payroll services. Between now and 2005, business services are expected to grow 47 percent. This relative slowdown compared to the eighties largely reflects the maturing of two young industries that experienced double digit rates of growth during the eighties: computer and data processing services and personnel supply services. Because of the world-wide trend toward automation, computer and data processing services is projected to remain among the fastest growing industries. Its projected growth of 90 percent in Massachusetts should result in 36,000 additional jobs over the projection period. Employment in temporary help agencies will also continue to grow rapidly, but not at the pace set during the eighties.

Demand for engineering, accounting, research and management services is expected to rise 41 percent between 1991 and 2005, with demand for accounting and research and testing services projected to be the strongest at 49 percent. Accounting firms have restructured to meet demand created



by globalization, offering more comprehensive services to build market share. Research and testing will be even more important in the future economy. Government spending for roads, bridges and other infrastructure components will increase demand for engineering and architectural services by 32 percent. However, this is well below the rate of growth recorded from 1980 to 1989. Since 1989 the industry has lost 5,000 jobs or 16 percent of its employment. Absorbing the office space erected during the building boom is expected to take much of the decade and keep engineering and architectural services from rising as fast as it did during the eighties.

Health Services

Health services include not only the large hospital industry, but also nursing homes, physicians and dentists offices, health maintenance organizations (HMOs), outpatient clinics, medical and dental laboratories, and home health care.

In 1991 health services employed 31 percent of service workers in Massachusetts, compared to less than 29 percent for the U.S. Massachusetts' health industries added 67,000 jobs during the 1980s. Factors behind this growth included: the aging of the population, medical advances in technology--such as magnetic resonance imaging and new and innovative treatments for cancer, heart disease and AIDS--and the increased paperwork required by both government and private insurers.

Jobs in health care are projected to grow 31 percent through 2005. Employment in offices of health practitioners and other health services, such as medical and dental labs, home health care, and HMOs are projected to grow even faster, 48 percent. This reflects the continued shift from inpatient care to outpatient and home care, the contracting of services by hospitals, and the increasing health needs of an aging population. The high concentration of teaching hospitals in Massachusetts attracts millions of research dollars, and this in turn creates demand for more people to fill more jobs.

Nursing home jobs are also projected to increase rapidly (41 percent) due to the increasing numbers of elderly. Of all the health care institutions, however, hospitals grew the slowest during the eighties and this trend is expected to continue. Nevertheless, a 15 percent growth rate will generate 19,400 hospital jobs over the period.

However, various public and private measures to restrain rapidly rising health care costs could have an impact on the health services projections.

Educational Services

Massachusetts' world renowned colleges and universities grew steadily throughout the eighties, expanding enrollments and establishing new laboratory facilities that enabled them to maintain a competitive advantage in the global marketplace. In this global economy, Massachusetts' universities and research laboratories will continue to foster the growth of a highly skilled work force and cutting edge technologies.

However, in a time of changing demographics that will diminish the number of college applicants for the forseeable future, Massachusetts' colleges and universities should still be able to record small job gains. This will be due to both the reputation of our universities and their ability to attract more older, part-time students.

Elementary and secondary education employment should rise more rapidly as demographic trends start showing population increases in these age groups.

Legal Services

Demand for legal services expanded rapidly over the decade. In addition to lawyers, total industry employment more than doubled. This growth in part reflected the overall growth of the economy, increased government regulatory activity, increases in business mergers and acquisitions and class action law suits.

The legal profession in Massachusetts currently is restructuring. The 1990-91 recession increased competition among lawyers and law firms for business. In a profession previously considered immune to economic conditions, some law firms are freezing rates, laying off associates and merging with other firms to provide more comprehensive legal services. Between 1990 and 1991, the legal industry shed three percent of its employment.

Over the projection period demand for legal service plans (similar to group health insurance), legal clinics, and the increased complexity of laws governing international trade will stimulate the demand for lawyers, paralegals and secretaries. Employment in this industry is projected to grow 48 percent through 2005.

Social Services

Demand for social services is expected to rise 43 percent between 1991 and 2005. Growth in residential care--such as homes for children, the aged, and the handicapped, group foster homes, and drug and alcoholic rehabilitation centers--is expected to be the strongest, projected at 62 percent. Individual and miscellaneous services such as adult day care centers and family social services should expand 35 percent. Child day care is also projected to grow 36 percent, although this rate is well under the growth rate of the eighties and reflects the decreasing numbers of

Growth of Selected Industries: 1991-2005

	Current Jobs	New Jobs	Growth Rate
Services	892,900	278,100	31%
Fastest Growing Industries			
Computer Software & Related	40,000	36,100	90%
Residential Care Services	14,000	8,700	62%
Offices of Health Practitioners	61,000	31,500	52%
Credit Reporting Agencies	2,800	1,400	50%
Job Training & Vocational Services	6,900	3,400	49%
Accounting & Services, n.e.c.	15,700	7,700	49%
Research & Testing Services	24,300	11,900	49%
Legal Services	27,000	13,000	48%
Nursing Homes	57,800	23,800	41%
Health Services, n.e.c.	28,000	11,000	39%
Misc. Business Services	25,200	9,800	39%
Management & P.R. Services	26,600	10,000	38%
Libraries & Voc Ed. Schools	7,300	2,600	36%
Child Day Care Centers	11,000	3,900	35%
Individual & Misc. Social Services	31,700	11,100	35%
Industries Adding the Most New Jobs			
Computer Software & Related	40,000	36,100	90%
Offices of Health Practitioners	61,000	31,500	52%
Nursing Homes	57,800	23,800	41%
Hospitals	129,800	19,400	15%
Legal Services	27,000	13,000	48%
Research & Testing Services	24,300	11,900	49%
Individual & Misc. Social Services	31,700	11,100	35%
Health Services, n.e.c.	28,000	11,000	39%
Personnel Supply	37,200	10,400	28%
Management & P.R. Services	26,600	10,000	38%
Hotels	32,000	9,900	31%
Misc. Business Services	25,200	9,800	39%
Engineering & Architectural Services	27,100	8,700	32%
Residential Care Services	14,000	8,700	62%
Accounting & Services, n.e.c	15,700	7,700	49%
Amusement & Recreation Services	22,400	6,200	28%
Colleges & Universities	96,600	6,000	6%
Auto Repair Services	19,000	5,700	30%

Wholesale and Retail Trade Job Outlook

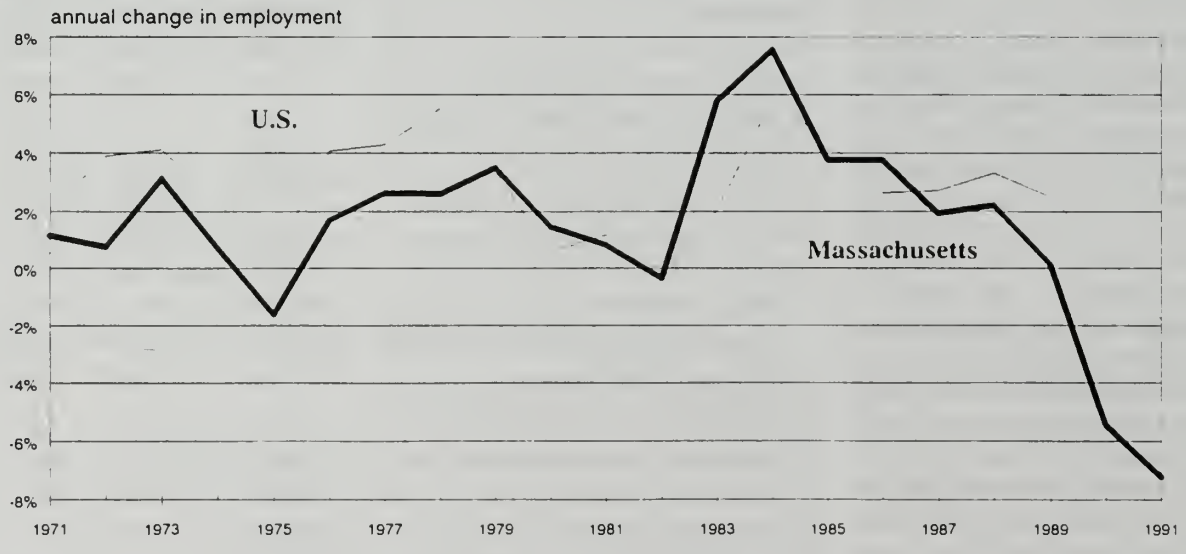
Industry Profile and Projections
This sector is divided into two industries: retail trade and wholesale trade. Retail trade consists of establishments and businesses that sell merchandise for personal or household consumption, while wholesale firms are principally engaged in selling large quantities of goods to retailers, industrial, commercial and business users, and other wholesalers.

Employment in wholesale and retail trade is projected to increase 15 percent to nearly 750,000 jobs by 2005. This marked slowdown compared to the eighties results from slower growth in personal spending for retail goods. The population is expected to grow more slowly, and anticipating the need to start saving for retirement, consumers will be spending less on retail goods. Nevertheless, over 76,000 jobs should be generated in retail trade through 2005, up almost 16 percent from 1991. Eating and Drinking Places should account for more than one out of four projected new jobs in retail trade.

Recent Trends
Employment in wholesale and retail trade grew rapidly throughout much of the eighties. The long running expansion during this period kept unemployment rates low and disposable incomes high. Massachusetts' employment growth in trade mirrored the rise and fall of the state's economy. It advanced an average of over three percent per year from 1980 to 1989, nearly twice as fast as the annual average rate of the 1970s.

Massachusetts' trade employment expanded faster in wholesaling than in retailing, due to the number of high tech manufacturing distributors in the state who fared well during the eighties. However, when economic growth leveled off in 1989, Massachusetts' wholesalers had to streamline their

Employment in wholesale and retail trade grew rapidly between 1983 and 1988.



operations, and cut employment 12 percent over the next two years. These cuts, combined with similar ones in retailing, dropped overall trade employment 12 percent. This erased the 1984-89 job gains and retured employment to a pre-boom level of 649,500 in 1991.

U.S. Trends

In the United States, employment growth in wholesale and retail trade lasted one year longer than the Massachusetts expansion and was just as rapid. However, unlike Massachusetts, the 1980s growth was slower than the rate during the 1970s. Nevertheless, trade accounted for nearly 30 percent of total U.S. job growth during the decade.

Growth in Perspective

Slower growth in Massachusetts' population and labor force have kept the state's annual employment growth rates in trade below the national rates for all but four of the past 21 years (see chart below). Over the projection period, this trend is expected to continue.

Job Outlook by Industry:
Wholesale Trade

Jobs in wholesale trade should increase by 22,000 or 14 percent and account for 22 percent of the total trade growth through 2005. The projected expansion will parallel overall economic growth in Massachusetts.

Wholesalers function as the unseen middleperson in the economy. They serve as a conduit between manufacturers and retailers, as well as a distributor of goods to foreign buyers. As a result, the industry's job growth is closely tied to overall economic growth in manufacturing, exports, and the economy at large.

This tie could easily be seen in the eighties with the explosion of new products such as computers, word processors, voicemail, microwaves, and medical equipment. Demand for these new products generated rapid growth in both manufacturing and wholesaling, especially in Massachusetts, where many of these high tech products were manufactured. Wholesale trade job growth moderated between 1984 and 1989, as overall economic growth moderated.

Similarly, when the Massachusetts economy peaked in early 1989, wholesale trade employment peaked and when the economy went into recession employment fell as well, dropping 12 percent between 1989 and 1991. As the Massachusetts economy expands and demand for goods rise, wholesale trade employment will rise correspondingly.

Retail Trade

Retail trade accounts for the bulk of the trade jobs generated over the projection period (78%). This industry rose rapidly during the eighties as incomes rose and more workers than ever were employed. In 1970, for example, 60 percent of Massachusetts' working-age population held jobs. Ten years later this percentage rose two points to 62 percent. By 1989 it rose to an all time

Growth of Selected Industries: 1991-2005

	Current Jobs	New Jobs	Growth Rate
Wholesale & Retail Trade	649,600	98,700	15%
Wholesale	158,200	22,000	14%
Retail	491,400	76,700	16%
Fastest Growing Industries			
Apparel Speciality Stores	38,900	12,700	33%
Eating & Drinking Places	160,100	26,200	16%
Misc. Retail Stores	75,300	12,200	16%
Furniture & Furnishings Stores	20,600	3,100	15%
Wholesale Trade	158,200	22,000	14%
Food Stores	93,200	12,300	13%
Automotive Dealers	38,700	4,300	11%
General Mdse Stores	47,400	4,400	9%
Lumber & Garden Supply Stores	17,200	1,500	9%
Industries Adding the Most New Jobs			
Eating & Drinking Places	160,100	26,200	16%
Wholesale Trade	158,200	22,000	14%
Apparel Sepciality Stores	38,900	12,700	33%
Food Stores	93,200	12,300	13%
Misc. Retail Stores	75,300	12,200	16%
General Mdse. Stores	47,400	4,400	9%
Automotive Dealers	38,700	4,300	11%
Furniture & Furnishings Stores	20,600	3,100	15%
Lumber & Garden Supply Stores	17,200	1,500	9%

high of 66 percent. This dramatic rise in Massachusetts' employment-population ratio created plenty of demand for clothing, cars, appliances, and other retail goods. Accordingly, retail trade employment increased 26 percent and generated more than 115,000 jobs between 1980 and 1989, one out of four new jobs in the Commonwealth. Also factors in this growth were changing lifestyles, in particular the growth in the number of women who worked outside the home and the increase in the number of workers who held part-time jobs.

In the 1990s, however, retail trade will expand more slowly in response to slower growth in population, labor force and household formations. Over the decade the number of new workers entering the work force along with the number of new shoppers will slow, thus keeping retail trade from rising as rapidly as in the eighties.

The largest retail trade industry, eating and drinking places, is expected to expand 16 percent, down from the 25 percent growth recorded from 1980 to 1989, and generate 26,200 jobs. This growth rate, however, will still account for approximately 34 percent of the jobs generated in retail trade between 1991 and 2005, approximately the same percentage share as in the eighties.

Food stores--grocery, bakery, fruit and vegetable markets--comprise the second largest number of jobs in retail trade (19 percent), and expanded 30 percent between 1980 and 1989. A slower growing population, however, should restrain the growth in food stores to 13 percent and hold down the net increase to 12,300 jobs.

Growth in general merchandise stores and other specialty apparel stores; and miscellaneous retail stores such as drug, sporting goods, book, gift, and flower shops, will account for another 17,100 and 12,200 new jobs, respectively, by 2005.

Finance, Insurance and Real Estate
Job Outlook

Industry Profile and Projections
This division includes a broad range of firms such as banks and credit unions, securities and commodities brokers, insurance carriers, and real estate developers and managers.

Employment is expected to rise 14 percent, generating 28,000 new jobs by 2005. Job growth shifted dramatically under deregulation and is expected to continue shifting away from banking and insurance during the projection period. Jobs in banking and insurance, the two largest industries, should grow the slowest, as they did in the eighties. They will account for slightly more than one out of four projected new jobs in this sector.

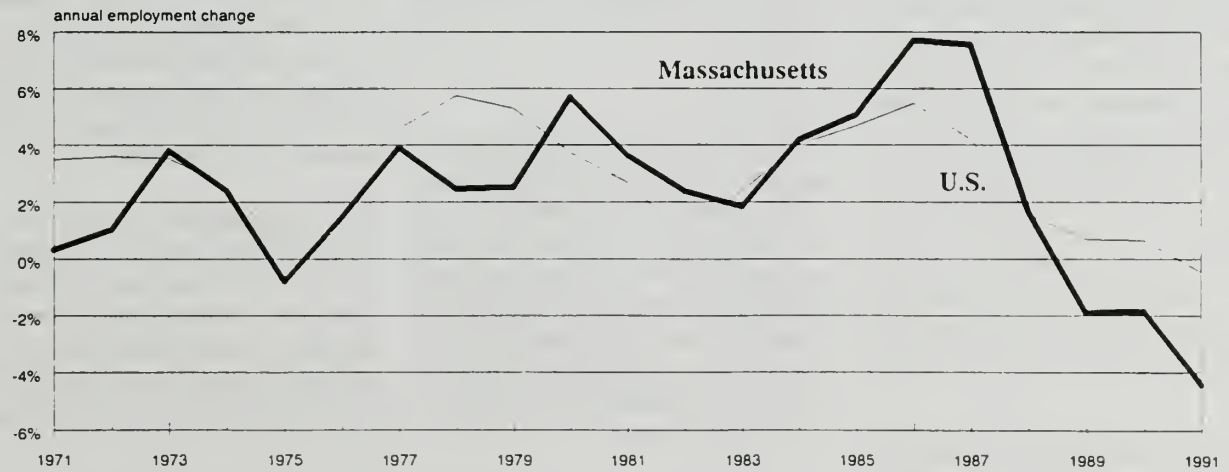
On the other hand, securities and commodities jobs grew the fastest in the eighties. Although the rate of growth will slow, employment in securities and commodities is still expected to grow twice as fast as total jobs in this sector. Massachusetts' strong presence in the mutual fund industry should result in good job creation.

Recent Trends
Both the national and indeed the New England region's prosperity led to record numbers of high paying jobs in this sector in the 1980s. Massachusetts' boom was all the more remarkable, however, for its rapid rise made in the context of slower population growth.

In Massachusetts, the largest state and the major financial center of New England, employment in this sector increased 34 percent, generating 54,300 jobs over the decade--nearly 17 percent of the state's total job growth. This relatively small sector--accounting for just over 200,000 jobs, or seven percent of the state's jobs in 1991--generated 62,500 jobs between 1980 and 1988, before declining and losing 17,600 jobs by 1991. A number of forces led to the sector's rapid gains and subsequent job losses.

Deregulation. In addition to strong economic growth, banking industry deregulation also contributed to this boom. Under the Depository Institu-

During the 1980s both the national and indeed the New England region's prosperity led to record numbers of high paying jobs in finance, insurance and real estate sector.



tion Deregulation and Monetary Control Act, Massachusetts banks were free to pursue new lending opportunities and did so, aggressively. They became bigger institutions with more capital and assets and larger branch networks. These events dramatically changed the financial service industry. But they also led to the practice of highly speculative ventures in real estate and other non-traditional investments on the chance that huge profits could be made.

When Massachusetts' economy plummeted between 1988 and 1991, employment in this sector fell just as swiftly. Real estate dropped the sharpest, about 17 percent, yet contributed to less than a third of total sector losses. The biggest job losses occurred in banking.

Under the weight of non-performing real estate loans and other financial investments several Massachusetts banks collapsed, including one of New England's largest in 1991. To cover these losses banks cut costs and eliminated approximately 10,000 jobs from their payrolls between 1988 and 1991, accounting for over half the losses in finance, insurance and real estate.

Employment in insurance companies also declined after the boom. The consolidations of many "backroom" activities led to a smaller work force requirement and thus to employment reduction in this industry.

Shifts in Job Growth. Deregulation has had a profound affect on both jobs and job growth among financial institutions, in contrast to previous decade growth patterns. Demand for mutual funds and securities expanded as inflation and interest rate ceilings prompted investors to seek alternatives to traditional savings methods. In Massachusetts, many of these firms expanded faster than their U.S. counterparts and accounted for a greater share of the state's new jobs in this sector than the U.S. (38% vs 32% between 1980 and 1990).

Of all industries within this sector, employment increased the slowest in banking and insurance carriers. This was due to the two largest industries in this sector experiencing increased competition from many non-banks for savings and investment dollars. Combined they accounted for approximately 33 percent of the growth within the sector. Their share of FIRE employment fell 9 percentage points to 59 percent. In the 1990s this trend will continue.

Growth of Selected Industries: 1991-2005

	Current Jobs	New Jobs	Growth Rate
Finance, Insurance and Real Estate	201,200	28,100	14%
Fastest Growing Industries:			
Credit Agencies & Investment Offices	10,600	4,500	42%
Security & Commodity Brokers	22,500	6,900	31%
Insurance Agents and Brokers	22,700	4,500	20%
Real Estate	28,100	4,600	16%
Insurance Carriers	53,300	4,500	8%
Depository Institutions	64,000	3,000	5%
Industries Generating the Most New Jobs:			
Security and Commodity Brokers	22,500	6,900	31%
Real Estate	28,100	4,600	16%
Insurance Carriers	53,300	4,500	8%
Credit Agencies & Investment Offices	10,600	4,500	42%
Insurance Agents and Brokers	22,700	4,500	20%
Depository Institutions	64,000	3,000	5%

U.S. Trends
U.S. employment growth in this sector was just as impressive during the eighties. However it did not exceed the growth rates of the seventies, and since 1988 has begun to ebb. Unlike Massachusetts' drop in 1989, U.S. employment did not dip until 1991. Over the projection period U.S. employment growth is expected to continue to be slow, expanding 21 percent.

Historical Perspective
Annual employment growth in finance, insurance and real estate fluctuates sharply over the business cycles. The chart on the previous page shows average annual employment increases in this sector in both Massachusetts and the U.S from 1970-1990. Massachusetts' performance generally lagged behind national increases throughout the seventies, but exceeded U.S. growth all but once during the growth period between 1980 and 1988.

In the aftermath of the October 1987 stock market crash U.S. employment in securities fell between 1988 and 1989. However, this watershed event did not negatively impact Massachusetts' financial employment, although growth did slow to its lowest level of the decade.

Job Outlook by Industry
In general, in this sector automation will hold down future job growth both locally and nationally. Massachusetts' growth will continue to lag U.S.

Banks & other Depository Institutions
Job growth in banks and other depository institutions will continue to trail the growth of mortgage companies, business credit institutions, security brokers and other nondepository financial institutions in the 1990s. The drive toward industry consolidation which began in 1991 will continue over the short term. Duplicate jobs will be eliminated and many banks will emerge from the recession looking to improve market share and attract fresh capital. Employment in banking will increase nearly five percent by 2005. Although this modest gain does not return employment to its peak of 69,000 workers, banks should generate 3,000 jobs and account for over ten percent of the total growth in this sector.

Nondepository Holding and Investment Offices
Although the rapid growth rate of the 1980s will not be sustained in the 1990s, as this industry matures, slower but steady growth is expected through 2005. The gradual aging of the baby boom generation bodes well for Massachusetts' financial service firms that assist people in saving for retirement. Benefitting from these trends, employment in this small industry should increase the fastest (43%) and generate 4,500 new jobs.

Security and Commodity Brokers and Dealers
These jobs quadrupled from 1977 to 1990, making this the fastest growing industry in the sector. Although this explosive growth will not be duplicated in the 1990s, this industry will account for the most jobs in the sector over the projection period (6,900). Increased concern for investing and saving for retirement will be primarily responsible for the growth.

Insurance
Job growth in the insurance industry varies. In the major carriers of insurance--life, property and health--jobs are projected to increase only eight percent between 1991 and 2005, as many backroom operations are automated. Jobs with smaller insurance agents and brokers will expand 20 percent. The independent insurance industry employs fewer than half the number of workers as the major carriers. However, since its work force has more direct contact with customers, explaining policy coverage to the insured, it is less likely to be affected by automation.

Real Estate
Massachusetts' real estate industry peaked in 1987 and has since lost over 6,000 jobs. As the economy improves and people's sense of job security is restored, the real estate industry should revive, and is expected to expand by 16 percent or 4,600 jobs by 2005. Although this rate of growth does not recover all jobs lost since 1987, the industry should still account for 14 percent of the jobs in this sector by 2005, the same percentage share as in the early 1980s, before the boom.

Transportation, Communications, and Utilities Job Outlook

Industry Profile and Projections
This sector includes firms providing passenger and freight transportation, communication services, utility services such as gas and electricity and water and sanitation services.

This is the slowest growing private service sector division, and is projected to increase under ten percent and generate about 12,000 new jobs. Water and sanitary services will be the fastest growing industry, while telephone and telegraph communication services will continue to decline. Continued advances in technology will be responsible for reduced employment in this highly competitive industry.

Recent Trends
This sector is highly sensitive to the business cycle and local and regional demographics. Massachusetts' industry employment expanded 7 percent--just over half that of the U.S. --during the 1980s.

Job growth was uneven among the sector's major industries. Transportation and public utilities posted slow, but steady gains after the 1981-1982 recession, while communications lost jobs following the divestiture of AT & T.

Even within individual industries, employment growth varied. Employment in trucking and local and interurban transportation--the two largest industries within transportation--increased slowly, mirroring the region's sluggish increases in population and labor force. At the same time, air transportation and travel agencies boomed under deregulation and the sharp rise in personal income. Similarly, jobs in utilities expanded slowly in contrast to jobs in sanitary and environmental services.

U.S. Trends
U.S. employment in this sector increased 13 percent from 1980 to 1990. This growth was nearly identical to the growth recorded in the seventies. Over the

Masssachusetts' annual employment growth in transportation, communications & utilites lagged behind U.S. growth for much of the past two decades

projection period, U.S employment is projected to expand by roughly the same amount, 15 percent.

Growth in Perspective

The following chart shows the percentage change in transportation, communications and utilities employment from 1970 to 1990. Percentage changes in both Massachusetts and U.S. employment fluctuate sharply during recessions and expansions. Due to sluggish increases in population, Massachusetts' job growth lagged behind the U.S. for most of the seventies and eighties. It outpaced the U.S. only once during the eighties when unemployment fell to 3.2 percent in 1987 (a rate so low that many economists thought Massachusetts had reached full employment). Over the projection period, jobs in transportation, communications, and utilities will expand more slowly as greater efficiencies in scheduling, marketing and cost control keep jobs from rising as fast as the average for all industries. Massachusetts' projected job growth will continue to trail U.S. growth.

Job Outlook by Industry

Job growth will vary over the projection period. Overall employment will increase 10 percent, but some sectors will have much greater increases and others will decline.

Transportation

Jobs in transportation should expand 17 percent between 1991 and 2005, as the economy recovers from the recession. Jobs in the three largest transportation industries--trucking, local and interurban transportation and air transportation--will expand about as fast as the average for all industries. Jobs for travel agencies, courier and delivery and other firms furnishing transportation services will continue to grow rapidly and should expand 53 percent as personal and business spending on travel and vacations increases.

Communications

Employment in telephone and telegraph services peaked in 1982 both nationally and locally and has since been on a downward trend following the divestiture of AT & T. Automation and increased competition will continue to lower employment. Over the projection period employment should decline by 5,100 jobs or 22 percent by 2005.

Communications includes hundreds of companies providing telephone, telex, and telegraphic services; cellular mobile radio services; paging services; networking services; and other communication services.

Employment in some of these areas is expected to expand rapidly, especially computer integrated systems design. Jobs in the telephone and telegraph service industry, however, should continue to decline as technology reduces the need for labor.

Growth in cable TV and other radio and broadcasting services boomed during the early eighties, and has since leveled off. Although job growth in this segment of communications will not offset other job losses in communications, the industry is projected to grow nearly 16 percent by 2005, as the economy expands.

Public Utilities

The job outlook in utilities is mixed. Demand for electricity and other natural resources is expected to increase more slowly as overall economic growth slows. Although jobs are projected to increase 16 percent, about as fast as the economy overall, refuse and other sanitary services should increase 77 percent and generate 3,900 jobs. Careful management and safeguarding of the environment and other natural resources underscore this projected growth.

Growth of Selected Industries: 1991-2005

	Current Jobs	New Jobs	Growth Rate
Transportation, Communications and Utilities	124,000	136,100	10%
Fastest growing industries:			
Water & Sanitary Services	5,100	3,900	76%
Passenger Transportation	6,600	3,500	53%
Misc. Transportation Services	2,100	1,100	52%
Local & Interurban Transportation	15,600	2,500	16%
Radio & TV Broadcasting & Cable TV	8,200	1,300	16%
Air Transportation	12,700	1,900	15%
Trucking & Wharehousing	26,400	3,300	13%
Industries adding the most new jobs:			
Water & Sanitary Services	5,100	3,900	76%
Passenger Transportation	6,600	3,500	53%
Trucking & Wharehousing	26,400	3,300	13%
Local & Interurban Transportation	15,600	2,500	16%
Air Transportation	12,700	1,900	15%
Radio & TV & Cable	8,200	1,300	16%
Misc Transport Services	2,100	1,100	52%
Electric Services	12,900	600	5%
Industries with the largest losses:			
Communciations, exc. Broadcasting	22,900	(5,100)	-22%

Construction Job Outlook

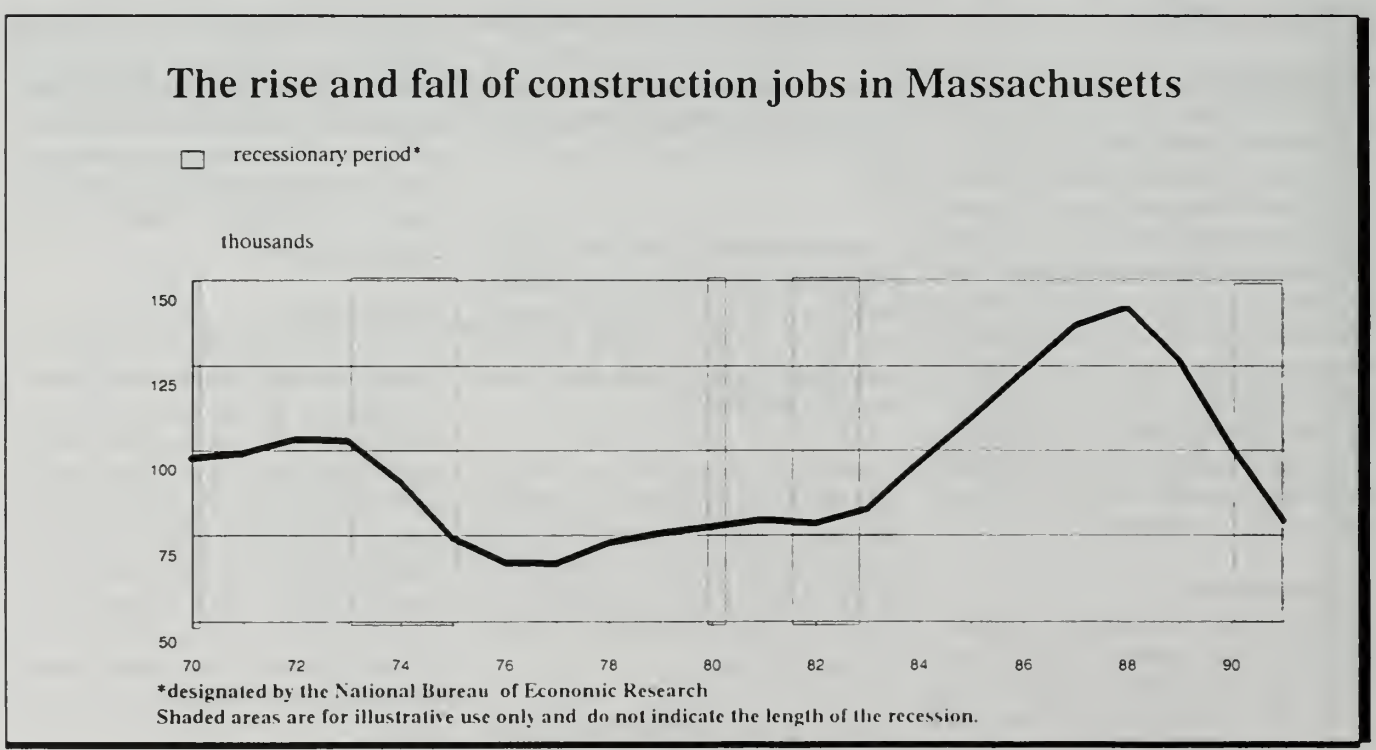
Industry Profile and Projections
This sector ecompasses three broad types of activities: new building construction by general contractors or construction firms, additions or alterations to existing buildings, and special trade contractors and repair work.

Jobs in construction are projected to increase 27 percent from their current low level to around 100,000, the same level as in 1990. Slower growth in population, employment, and household formations should dampen the demand for new residential and commercial construction. However, public works construction and renovations work for homes, hospitals, schools and plants should be strong. Construction should receive a much needed boost from planned major projects in infrastructure improvement, but these should be completed well before 2005. Special trade contracting should continue to be the strongest sector of construction. Mining accounts for little more than a thousand jobs in Massachusetts and should remain at about that level over the projection period.

Recent Trends
Construction is a relatively small industry in both Massachusetts and the U.S., accounting for fewer than five percent of all jobs. From 1980 to 1988, however, the construction industry in Massachusetts generated 64,700 jobs, or 14 percent of the state's total job growth. This compared to five percent of U.S. total job growth.

Several demographic and economic factors spurred the state's construction boom. The strong local economy, high per capita income, record low levels of unemployment and rise in household formations, for example, created demand for new homes and the renovation and repair of existing ones. Likewise, the surge in white collar employment and dramatic rise in service industries swelled demand for additional offices, hotels, restaurants and other retail stores.

Special trade contractors, particularly electricians, plumbers, brick and stone



masons and carpenters benefitted the most from the building boom and rise in per capita spending. The increased demand for improvements and renovations generated over 60 percent of the jobs in construction over the period.

General building contractors accounted for another 30 percent of the state's growth in construction with demand for new homes generating the bulk of Massachusetts' building construction jobs. Public works construction remained low for much of the decade and accounted for under three percent of the job growth in construction.

Massachusetts' construction boom ended in 1988, the year overall economic growth peaked. After reaching a high of 142,100, construction jobs plummeted 44 percent by 1991, dropping employment back to 1981 levels.

Since 1988, special trade contractors, the largest of the building trades workers, have lost the most jobs. However, they still comprise a greater share of the construction jobs in Massachusetts than in the U.S. (64% vs 60% in 1991). Due to the state's older housing stock, harsh climate and above average per capita income, Massachusetts' per capita spending on home repair and remodeling continually ranks among the highest in the country. Consequently, special trade contractors historically have accounted for more construction jobs here than nationally.

U.S. Trends

U.S. employment in construction increased more moderately in the eighties, than the seventies (18% vs 21%). It fell sharply during the 1990-1991 recession, declining 9 percent. This was the largest drop in employment since the 1974-75 recession. U.S. construction employment is projected to increase 29 percent between 1991 and 2005.

Growth in Perspective

The pattern of "boom and bust" in construction has occurred several times in the past three decades. In the late 1960s there was a sharp boom in employment, followed by a marked bust in the early and mid 1970s. In the 1980s and early 1991 this pattern repeated itself (see graph). As in the 1973-75 recession, the sharpest rate of decline in jobs occurred in construction. Once economic growth resumed employment levels recovered, albeit slowly, and finally surpassed their 1972 precession peak 13 years later.

Manufacturing Job Outlook

Industry Profile and Projections
Manufacturing is a diverse sector encompassing a broad range of firms. Generally speaking, all manufacturers transform raw materials such as paper, wood, plastic, steel, or chemicals into finished or semi-finished products. These products include durable goods such as computers, telephones, cameras, and light bulbs and nondurable goods such as paper and plastic products, food, medicine, and clothing.

Massachusetts' manufacturing employment is projected to fall eleven percent over the projection period in spite of the comparatively high growth rate for U.S. manufacturing output overall. Projected growth in manufacturing productivity will hold down employment. By 2005, manufacturing should account for 13 percent of the state's jobs.

Reductions in defense spending will continue to lower employment in aircraft engines and parts; communications; guided missiles; and search and navigational instruments. Nondurable goods industries are projected to keep up their historical rates of decline. However, two industries--printing and publishing and medical instruments--are expected to show sizable increases.

Recent Trends
Massachusetts and the U.S. experienced fundamental changes in both the structure and distribution of manufacturing jobs during the eighties. An increasing number of imports and eroding market share, caused many manufacturers to restructure, eliminating marginal product lines and inefficient plants. These changes occurred across the U.S., however, Massachusetts sustained the heavier manufacturing jobs losses.

Between 1980 and 1990 Massachusetts lost 152,000 manufacturing jobs, nearly 23 percent of its base, while the U.S. lost 6 percent. Tracing past and projected developments in manufacturing can explain its precipituous decline in Massachusetts and what will likely happen over the next 14 years.

Employment changes in Massachusetts' manufacturing roughly paralleled U.S. changes until 1985 when the state's manufacturing began to decline faster than the U.S.

The concentration of manufacturing jobs in Massachusetts differs dramatically from the U.S.; consequently when the value of the dollar fell, it did not appreciably boost employment in many of Massachusetts' manufacturing industries

Changes in Manufacturing Employment over Selected Turning Points, Massachusetts & U.S.

(annual percentage changes)

	1982-84 Expansion	1984-86 High Value of the U.S Dollar	1986-88 Lower Value of the U.S. Dollar	1988-91 Downturn
MA	4.9%	-8.0%	-4.8%	-17.1%
U.S.	3.2%	-2.1%	2.0%	-4.8%

Services Replaces Manufacturing as the Largest Employer

Throughout much of the 20th century manufacturing was the largest employer in both Massachusetts and the U.S. It was even more important to Massachusetts' economy, accounting for a higher proportion of the state's jobs and total personal income. But by 1982, the service sector replaced manufacturing as the state's largest employer.

From 1970 to 1980 manufacturing grew slowly, increasing 3.9 percent in Massachusetts and 4.7 percent in the U.S. Because of its cyclical nature, manufacturing in both Massachusetts and the U.S. suffered disportionately during the 1974-75 recession and lost more jobs than other industries.

But while manufacturing lost jobs during the recession, the service sector survived these years quite well, adding large numbers of jobs. Unable to match the service-producing sector's steady growth, manufacturing's share of total employment eroded. By 1980 the U.S. proportion fell to 22 percent and Massachusetts' to 25 percent, despite rapid expansion in high tech manufacturing during the latter half of the decade.

Even though manufacturing grew sluggishly in the '70s and lost its share of jobs, its long-term share of total output (GNP) remained fairly stable. (This is even true in the eighties when manufacturing lost jobs.) According to the U.S. Bureau of Labor Statistics, "this phenomenon partially reflects the superior productivity gains of manufacturing vis-a-vis the service-producing sector. However, the lack of long-term growth also stems from stiff competition." [1]

The Brief Rebound

Massachusetts' manufacturing rebounded quickly from the 1980 and 1981-82 recessions. This job growth spurt led many analysts to think that Massachusetts had successfully made the transition from a declining industrial base to high tech one and would thus be immune from further industrial restructuring. Indeed, Massachusetts' performance during the early 1980s suggested this.

Recession and Recovery. Massachusetts' manufacturing employment peak occurred in March 1980. By the start of the 1981-82 recession, manufacturing was off only slightly from its peak. In contrast to Massachusetts, the U.S. recovered less than half of the manufacturing jobs it lost from its June 1979 employment peak.

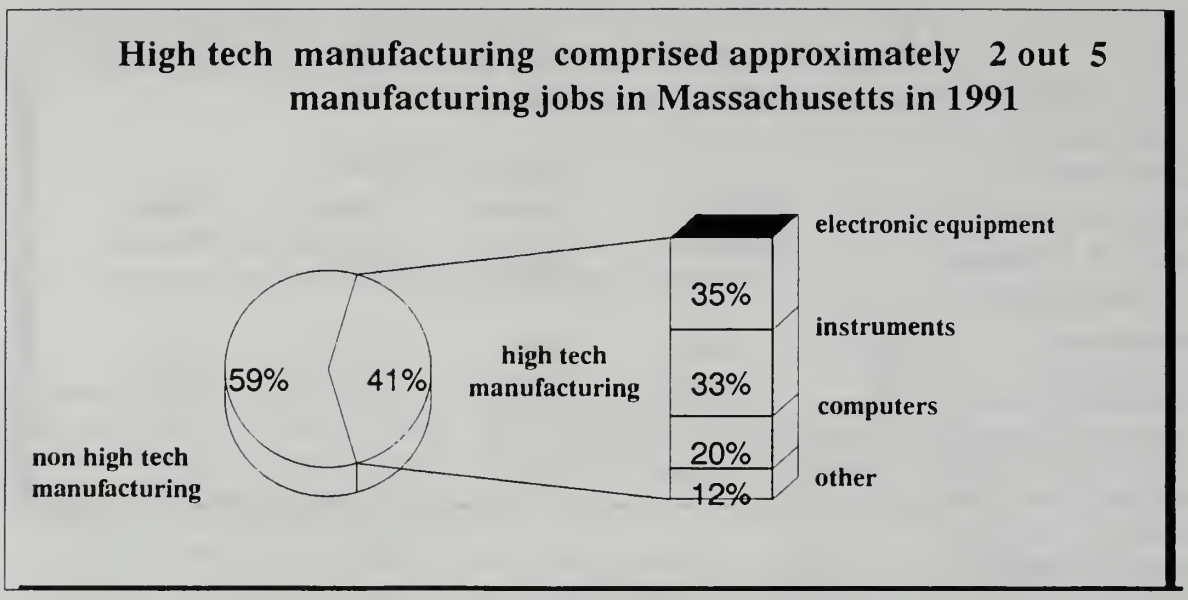
Although the 1981-82 recession displaced more manufacturing workers in both the state and nation, Massachusetts again fared much better. U.S. manufacturers eliminated 2.3 million jobs or 10 percent of their workforce. In the subsequent 20 month recovery, only 1.5 million jobs were recovered--just two thirds of those lost. In the 1981-82 recession Massachusetts lost nearly 60,000 jobs, about nine percent of its manufacturing base, but regained most of these jobs during the recovery period.

The Downward Spiral. Since 1984, however, Massachusetts' manufacturing has declined more rapidly than the U.S. for several reasons. When the strong value of the dollar abroad rendered Massachusetts and U.S. goods more expensive to other countries, high tech manufacturers in both the state and nation established overseas production sites to remain competitive. Consequently, when the value of the dollar fell, it did not appreciably boost employment here. Overseas production sites already put in place during the era of the high dollar prevented high tech manufacturing from rebouding in the 1980s.

The deterioration can also be explained in part by the industrial mix of the state's manfacturing.

Between 1986 and 1988, the period when the U.S. exchange rate improved, Massachusetts lost manufacturing jobs while the U.S. created jobs. The U.S. job gains varied by industry. Most of these occurred in non high tech manufacturing industries. However, the high tech computer industry lost jobs both nationally and locally, and because the computer manufacturing industry in Massachusetts accounts for more

[1] *Monthly Labor Review, September 1990*



manufacturing jobs here than in the U.S. (8 percent vs 2 percent in 1991), the declines were felt more sharply here. Massachusetts' overall manuacturing performance thus reflected its dominant high tech manufacturing industries.

By 1989, Massachusetts' slide worsened, declining faster than in the previous two years. The absence of continued vigorous growth in foreign demand, combined with sluggish domestic demand saw U.S. growth also level off. But manufacturing deteriorated much more rapidly in Massachusetts during the 1990-1991 recession and now accounts for approximately 17 percent of all jobs, both locally and nationally.

Losses in Perspective

The manufacturing losses between 1988 and 1991 were widespread. However, high tech manufacturing industries accounted for 40 percent of the total losses. Computers, the state's largest manufacturing industry, comprised 36 percent of the losses in high tech manufacturing. The concentration of high tech jobs in declining segments intensified the state's vulnerability to the current recession.

The significant job losses in the state and nation occurred at noticeably different periods within the decade. In the U.S., the bulk of losses occurred between 1980 and 1985, while in Massachusetts they occurred between 1985 and 1990. The impact was felt much later in Massachusetts as high tech manufacturers here fell to the same intense foreign competition that U.S steel and auto manufacturers already had encountered.

Job Outlook by Industry

Overall, Massachusetts manufacturing employment is projected to fall 11 percent and lose approximately 53,300 jobs between 1991 and 2005. Continued rapid growth of imports and a decline in defense spending will contribute to the overall employment decline. Although the losses will be widespread throughout the sector, durable goods industries will not drop as fast as nondurables. Nondurable goods industries have, and will continue to face, increased competition from imports and are projected to keep up their historical rates of decline.

Most manufacturing industries will have negative trade balances. The major exceptions are industrial machinery and equipment (computers); instruments and related products; food and kindred products; printing and publishing; and chemicals and allied products.

However, despite employment declines, the output of most manufacturing industries will increase. Expected improvements in productivity will cause many industries to become more competitive in word markets. This will cause a significant rise in exports and limit the employment decline that would have otherwise occurred.

The projected decline in defense spending will significantly impact those industries that historically have relied on defense contracts for much of their business, including communications equipment; aircraft and the related aircraft and missile engines; and guided missiles and space vehicles.

Computer Manufacturing

With 8 percent of manufacturing jobs compared to 2 percent in the U.S., computer manufacturing in Massachusetts, lost jobs at a much faster rate than the nation. Between 1984 and 1991, approximately two out every five computer industry jobs in Massachusetts were lost. Over the decade corporate restructuring due to continued intense competition, sluggish sales, and product standardization will lead to more workforce reductions in this industry.

Between 1991 and 2005, 4,000 computer jobs are projected to be lost. Even with this decline, however, Mas-

sachusetts is still expected to retain approximately nine percent of the nation's computer jobs, and account for approximately eight percent of Massachusetts' manufacturing.

Electronic & Electrical Equipment
This industry accounts for 68,000 jobs, more than 14 percent of total manufacturing employment. Massachusetts manufactures a wide range of traditional and high tech products such as electrical and electronic components; lamps and other wiring devices; power distribution and specialty transformers; telephones; network equipment; electron tubes; printed circuit boards, resistors, switches; and powerful defense communications.

Overall employment in electronic and electrical equipment manufacturing is projected to fall 4 percent between 1991 and 2005. However, the projections vary for the two largest components of this industry: communications and electronic components.

Communications. Jobs in communications are projected to decline more than twice as fast as the overall rate of decline in electronic and electrical equipment. Until 1985, increases in defense spending offset job losses in the telephone communication portion of this industry. But when defense spending peaked in 1985, the defense communication sector could no longer offset these declines. Consequently, employment in communications peaked in 1985 and has since fallen rapidly. Over the projection period, rapid job losses in communications are expected to ease, the result of strong business and consumer demand for new technological developments in telecommunications. In the large defense communications sector, layoffs have already begun and are likely to continue.

Electronic components. Jobs in this industry peaked in 1984 then declined rapidly. Demand from key end-user markets--computers, communications, and instruments--fell in response to slugglish sales, increased foreign competition, and declining defense contracts. Although this industry is expected to recover from the 1991 recession and grow 4.6 percent, this rate will not bring employment back to peak levels.

Transportation Equipment
The building of jet engines and guided missiles now accounts for 24,300 jobs, 94 percent of the jobs in Massachusetts' transportation equipment manfacturing industry.

Since defense spending peaked in 1985, nearly 5,000 jobs have been cut in aircraft engines and guided missiles. Massachusetts did not experience growth as rapid as the U.S in the eighties. Massachusetts employment in guided missiles peaked in 1986, two years earlier than the U.S. Continued reductions in defense spending will lead to further cuts in jobs. Layoffs are expected to continue, but at a slower rate.

Instruments
The making of cameras, radar systems and equipment, medical equipment, and measuring and controlling instruments accounts for another 13.6 percent of Massachusetts' manufacturing jobs. Between 1988 and 1991 jobs in instruments fell 9.1 percent. Jobs lost in photographic instruments contributed to 75 percent of the losses.

Medical Instruments. This was one of the fastest growing segments of Massachusetts manufacturing over the decade. Jobs in medical instruments will expand 24 percent between 1991 and 2005, primarily due to the aging of the population and the expected continuing purchase of new high technology equipment by hospitals and other health institutions.

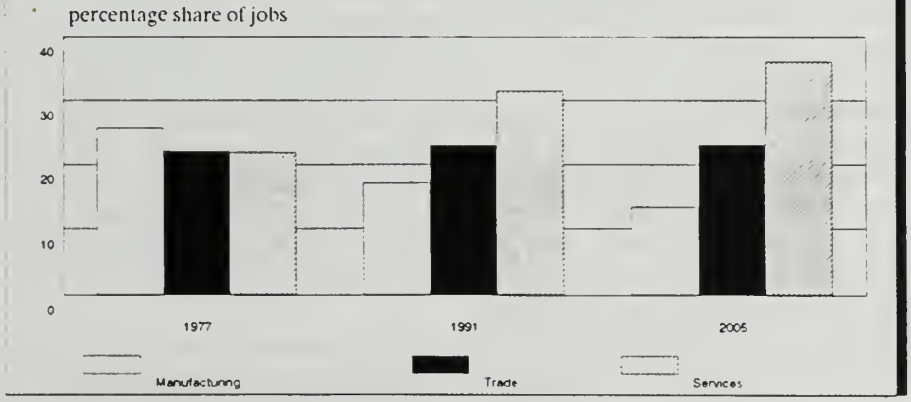
Medical and Controlling Instruments
This segment comprises 37 percent of the jobs in instruments. Expanding investment in equipment will support the sales of process control instruments. However, some manufacturers may establish operations outside the U.S. Jobs are projected to decline 15 percent between 1991 and 2005.

Photographic Instruments and Supplies. During the 1980s this industry restructured, implemented cost containment procedures and cut 7,000 jobs from its payrolls. As competition among the many manufacturers of cameras, film and other photographic equipment continues to intensify, more operations may be moved offshore. This industry is expected to lose another 27 percent of its employment.

Search & Navigational Instruments. This sector is heavily dependent on the demand for new military aircraft. Cutbacks in defense spending are projected to reduce jobs by 11.5 percent.

Miscellaneous Manufacturing
Firms in this industry produce goods

Manufacturing's share of jobs will continue to shrink over the 1991-2005 period



such as jewelry, silverware, sporting goods, toys and games, not previously classified in other manufacturing industries. Miscellaneous manufacturing is an export industry in Massachusetts, accouting for 3.4 percent of the manufacturing jobs here compared to 1.1 percent in the U.S. These jobs declined 35 percent between 1980 and 1990, and are projected to decline 11 percent between 1991 and 2005.

Nondurable Goods Industries
Industries in this category are extremely price sensitive, and in Massachusetts the wages are above the national average. Consequently, Massachusetts employment in nondurables fell more rapdily than the nation's. Imports of shoes, clothing, leather, paper and other nondurable goods took its toll on a number of jobs in Massachusetts nondurable goods industries. The state lost more jobs in this segemnt from 1980 to 1990 than from 1970 to 1980. (59,000 vs 47,000). Over the projection period, these industries are projected to lose 23,600 more jobs, a 14 percent decline.

Printing and publishing and chemicals were the only two industries that did not decline during the eighties. Over the projection period, printing and publishing is once again the only manufacturing industry projected to generate jobs, while chemicals will remain essentially unchanged.

Textiles, Apparel and Leather
In these labor intensive industries Massachusetts lost over 45,000 jobs, more than half their workforce, between 1980 and 1990. Over the 1991-2005 period, these industries are projected to maintain their historical rates of decline, as the trade deficit for apparel is projected to worsen.

Printing and Publishing
Printing and publishing was the only nondurable goods industry to increase employment during the eighties. Fueled by the information boom, jobs in printing and publishing increased 16 percent between 1980 and 1990. Over the projection period as economic growth slows, jobs in printing and publishing will increase more slowly.

This industry's employment peaked in 1987 when Massachusetts reached full employment, and has since lost over 6,000 jobs, eleven percent of its workforce. The eleven percent projected increase will not restore employment to its peak level.

Chemicals and Allied Products
This industry produces pharmaceuticals, soaps, detergents and plastics for a variety of uses, particularly automotive and home appliance parts. It employed 17,500 workers in 1991, less than four percent of Massachusetts' manufacturing jobs. Employment is closely tied to the overall health of the U.S. economy.

Plastics materials and synthetics; Drugs and Pharmaceuticals. Plastic materials and synthetics is the largest segment of the chemical industry in Massachusetts. Employment declined marginally between 1988 and 1991 as overall U.S. growth declined. Over the projection period, jobs in this industry will remain virtually unchanged. Pharmaceuticals are projected to increase slightly.

Rubber and Plastics
Rubber and miscellaneous plastics account for 13 percent of the nondurable goods jobs in Massachusetts. Employment declined 22 percent between 1980 and 1990, in contrast to the U.S. where it expanded 37 percent. Massachusetts' higher electricity and wage costs contributed to the poor performance in this highly competitive industry. Over the projection period, this industry is expected to lose another 3,200 jobs, dropping employment to 13,500 by 2005.

Changes in Selected Industries: 1991-2005

	Current Jobs	Jobs Added/lost	Rate of Decrease/Increase
Manufacturing	484,700	(53,300)	-11%
(Durable Goods)	311,800	(29,800)	-10%
(Nondurable Goods)	168,300	(22,800)	-14%
Fastest Growing Industries			
Medical Instruments	13,500	3,200	24%
Printing and Publishing	49,500	5,500	11%
Industries with the Largest Declines			
Apparel	17,500	(7,200)	-41%
Food	19,500	(5,700)	29%
Textiles	13,900	(4,700)	-34%
Computers	39,600	(4,000)	10%
Measuring & Controlling Instr	24,700	(3,600)	-15%
Misc. Plastics Products	16,700	(3,200)	-19%
Guided Missiles	15,800	(3,100)	-20%
Leather and Leather Products	6,100	(3,000)	-49%
Paper and Related Products	21,000	(2,800)	-13%
Special Industry Machinery	8,900	(2,700)	-30%
Photographic Equipment	9,200	(2,500)	-27%

Government Job Outlook

Industry Profile and Projections
This sector encompasses all governments-federal, state, and local-plus administrative and regulatory agencies and authorities in areas such as transportation and water resource management. It also includes certain industries also found in the private sector, such as schools and hospitals. Between 1991 and 2005, Massachusetts' government employment is expected to increase only about nine percent, as more and more government services are streamlined and contracted to the private sector.

Rising school enrollments and demand for medical care account for 60 percent of the projected new jobs in state and local government. Overall employment in the federal government will expand slowly over the projection period, with jobs in many branches declining.

Recent Trends
Between 1980 and 1990 employment in all three levels of government (federal, state, and local) decreased 3 percent in Massachusetts and increased 13 percent in the U.S. This was well under the respective 28 and 29 percent growth rates of the seventies.

Between 1980 and 1982, the recessions, large layoffs of federally funded government workers, and reduced revenues due to tax reform measures all contributed to Massachusetts' government employment falling nearly ten percent. As the economy improved and state and local revenues increased, government employment in 1988 nearly returned to 1980 levels. Jobs in federal government recovered the fastest, although some agencies' employment levels are still below 1980 figures. Jobs in state government also recovered fully, increasing nearly 10 percent between 1982 and 1988. Local government, however, did not regain all of the jobs lost from 1980 to 1982. Since Massachusetts' economic growth levelled off in 1988, by 1991 government employment had fallen 6 percent.

Employment increases in government in Massachusetts parallelled U.S. increases between 1985 and 1988 when state and local revenues improved.

U.S. Trends
U.S. job growth in government slowed markedly during the 1980s. Civilan jobs in federal government expanded the slowest, followed by jobs in local government and state government.

Historical Perspective
The chart on the preceding page shows annual changes in government employment for Massachusetts and the U.S. With a relatively smaller share of government employment, Massachusetts shows much sharper percentage change fluctuations. However, employment increases in Massachusetts have generally lagged U.S.increases.

A notable exception occurred between 1976 and 1978 when the state's government outpaced that for the U.S. Much of this increase in Massachusetts was attributed to jobs funded by the federal government under the Comprehensive Employment and Training Act (CETA). Massachusetts' government employment fell a year later when the economy improved and federally funded workers hired under CETA were laid off.

"Proposition 2 1/2" and other tax reform movements of the eighties kept government employment from rising as fast as it did during the seventies. But as state and local revenues improved, government employment increased. When Massachusetts' economic growth leveled off and tax revenues fell short of spending, the states' deficit increased and government employment fell.

Federal government employment remained unchanged for much of the decade. The hiring of temporary workers to conduct the 1990 census added 1,200 jobs between 1989 and 1990. However, employment fell back to historical levels when the census was completed.

Job increases and decreases in other federal agencies mirrored the decade's problems and changes in priorites. In the justice department, particularly in drug enforcement, job increases reflected the renewed efforts to interdict illegal drug trafficking. Similarly, job increases in the post office mirrored the eighties strong economic expansion and the rapid rise of business transactions in an expanding economy.

Growth of Selected Industries: 1991-2005

Industry/Sector	Current Jobs	New Jobs	Growth Rate
Government	384,400	34,000	9%
Federal Government	61,700	1,400	2%
State & Local Government	322,700	32,600	10%
Fastest Growing Industries			
State & Local Hospitals	19,900	4,300	22%
Local Education	128,800	18,500	14%
State Education	21,900	2,600	12%
Post Office	26,600	2,400	9%
State Govt., exc hosp & education	60,200	4,300	7%
Local Govt., exc hosp & education	91,900	2,900	3%
Industries Adding the Most New Jobs			
Local Education	128,800	18,500	14%
State & Local Hospitals	19,900	4,300	22%
State Govt., exc hosp & education	60,200	4,300	7%
Local Govt., exc hosp & education	91,900	2,900	3%
State Education	21,900	2,600	12%
Post Offices	26,600	2,400	9%
Industries with the Largest Declines			
All other Federal Government	35,100	(1,000)	-3%

Job Outlook by Industry
In general, government will expand more slowly through 2005 as the move toward "privatization" and streamlining of government services continues.

Federal Government
Jobs in the post office are projected to increase nine percent, but jobs in other branches of the federal government are expected to decline 2.8 percent.

State and Local Government
Jobs in state and local government are expected to increase 10 percent between 1991 and 2005. Rising school enrollments and demand for medical care will increase jobs in elementary and secondary schools, colleges and universities, and hospitals, and account for approximately six out of ten net new jobs in state and local government. Increases in demand for judicial and penitentiary reform, police protection and safety, environmental cleanups, welfare reform, and a new infrastructure should account for the remaining projected new jobs in the state and local government agencies charged with these responsibilities.

Massachusetts Industry Employment Projections: 1991-2005

Industry	Employment 1991	Employment 2005	Net Change	Percent Change
Total	2,817,500	3,236,400	418,900	14.9%
SERVICE-PRODUCING SECTORS	2,252,300	2,703,000	450,700	20.0%
Services	892,900	1,171,000	278,100	31.1%
Hotels	32,000	41,900	9,900	30.9%
Personal Services	29,100	34,300	5,200	17.9%
Business Services	141,400	207,900	66,500	47.0%
Advertising	4,200	5,500	1,300	31.0%
Credit Reporting/Collection	2,800	4,200	1,400	50.0%
Mailing, Reprod/Stenographic Services	6,100	8,200	2,100	34.4%
Services to Buildings	22,600	26,900	4,300	19.0%
Miscellaneous Equipment & Leasing	3,300	4,400	1,100	33.3%
Personnel Supply	37,200	47,600	10,400	28.0%
Computer Software & Data Processing	40,000	76,100	36,100	90.3%
Misc. Business Services	25,200	35,000	9,800	38.9%
Auto Repair Services	19,000	24,700	5,700	30.0%
Miscellaneous Repair Shops	7,700	8,800	1,100	14.3%
Motion Pictures	8,100	9,600	1,500	18.5%
Amusement & Recreation Services	22,400	28,600	6,200	27.7%
Health Services	276,600	362,300	85,700	31.0%
Offices of Health Practitioners	61,000	92,500	31,500	51.6%
Nursing Homes	57,800	81,600	23,800	41.2%
Hospitals	129,800	149,200	19,400	14.9%
Health Services, not elsewhere classified	28,000	39,000	11,000	39.3%
Legal Services	27,000	40,000	13,000	48.1%
Educational Services, private	125,500	136,600	11,100	8.8%
Elementary Schools	21,600	24,100	2,500	11.6%
Colleges & Universities	96,600	102,600	6,000	6.2%
Libraries & Voc Ed. Schools	7,300	9,900	2,600	35.6%
Social Services	63,600	90,700	27,100	42.6%
Individual & Misc. Social Services	31,700	42,800	11,100	35.0%
Job Training & Related Services	6,900	10,300	3,400	49.3%
Child Day Care Centers	11,000	14,900	3,900	35.5%
Residential Care Services	14,000	22,700	8,700	62.1%
Museums	4,100	4,800	700	17.1%
Membership Organizations	31,800	34,600	2,800	8.8%
Engineering, Accting, Research & Mgmt	93,700	132,000	38,300	40.9%
Engineering & Architectural Services	27,100	35,800	8,700	32.1%
Accounting & Services, n.e.c	15,700	23,400	7,700	49.0%
Research & Testing Services	24,300	36,200	11,900	49.0%
Management & PR Services	26,600	36,600	10,000	37.6%
Agricultural Services	10,900	14,200	3,300	30.3%

Massachusetts Industry Employment Projections : 1991-2005

Industry	Employment 1991	Employment 2005	Net Change	Percent Change
Wholesale and Retail Trade	649,600	748,300	98,700	15.2%
Wholesale Trade	158,200	180,200	22,000	13.9%
Retail Trade	491,400	568,100	76,700	15.6%
Bldg. Mtrls, Hardware, Garden Supply	17,200	18,700	1,500	8.7%
General Merchandise Stores	47,400	51,800	4,400	9.3%
Food Stores	93,200	105,500	12,300	13.2%
Auto Dealers & Gasoline Stations	38,700	43,000	4,300	11.1%
Apparel and Accessory Stores	38,900	51,600	12,700	32.6%
Home Furniture, Furnishings & Equipment	20,600	23,700	3,100	15.0%
Eating & Drinking Places	160,100	186,300	26,200	16.4%
Miscellaneous Retail Stores	75,300	87,500	12,200	16.2%
Finance, Insurance & Real Estate	201,200	229,200	28,000	13.9%
Depository Institutions	64,000	67,000	3,000	4.7%
Credit Institutions & Investment Offices	10,600	15,100	4,500	42.5%
Security & Commodity Brokers	22,500	29,400	6,900	30.7%
Insurance Carriers	53,300	57,800	4,500	8.4%
Insurance, Agents, Brokers & Services	22,700	27,200	4,500	19.8%
Real Estate	28,100	32,700	4,600	16.4%
Transportation, Commun. & Utilities	124,200	136,100	11,900	9.6%
Railroad	2,900	2,800	(100)	-3.4%
Local & Interurban Passenger Transportation	15,600	18,100	2,500	16.0%
Trucking & Wharehousing	26,400	29,700	3,300	12.5%
Water Transportation	3,000	2,800	(200)	-6.7%
Transportation by Air	12,700	14,600	1,900	15.0%
Transportation Services	8,700	13,300	4,600	52.9%
Passenger Transportation Arrangement	6,600	10,100	3,500	53.0%
Miscellaneous Transportation Servics	2,100	3,200	1,100	52.4%
Communications	31,100	27,300	(3,800)	-12.2%
Communications, exc Broadcasting	22,900	17,800	(5,100)	-22.3%
Radio & TV Broadcasting & Cable TV	8,200	9,500	1,300	15.9%
Electric, Gas & Sanitary Services	23,800	27,500	3,700	15.5%
Electric Utilities & Combined Services	13,500	14,200	700	5.2%
Gas Production & Distribution	5,200	4,300	(900)	-17.3%
Water & Sanitary Services	5,100	9,000	3,900	76.5%
Government	384,400	418,400	34,000	8.8%
Federal Govt, Total	61,700	63,100	1,400	2.3%
Post Office	26,600	29,000	2,400	9.0%
All other Federal Govt	35,100	34,100	(1,000)	-2.8%
State & Local Hospitals	19,900	24,200	4,300	21.6%

Massachusetts Industry Employment Projections: 1991-2005

Industry	Employment 1991	Employment 2005	Net Change	Percent Change
State Education	21,900	24,500	2,600	11.9%
State Govt exc hospitals & education	60,200	64,500	4,300	7.1%
Local Education	128,800	147,300	18,500	14.4%
Local Govt exc hospitals & education	91,900	94,800	2,900	3.2%
GOODS-PRODUCING SECTORS	565,200	533,400	(31,800)	-5.6%
Mining	1,200	1,200	0	0.0%
Construction	79,300	100,800	21,500	27.1%
Manufacturing, Total	484,700	431,400	(53,300)	-11.0%
Durable Goods Manufacturing	316,400	285,900	(30,500)	-9.6%
Lumber & Wood Products	3,300	3,600	300	9.1%
Furniture and Fixtures	4,400	4,300	(100)	-2.3%
Stone, Clay, Glass Products	7,700	7,100	(600)	-7.8%
Primary Metals Industries	10,300	9,800	(500)	-4.9%
Fabricated Metal Products	38,200	33,200	(5,000)	-13.1%
Cutlery, Handtools & Hardware	7,900	6,300	(1,600)	-20.3%
Fabricated Structural Metal Products	7,400	7,100	(300)	-4.1%
Forgings & Stampings	4,500	4,200	(300)	-6.7%
Metal Services, n.e.c.	3,900	4,500	600	15.4%
Ordnance	5,400	4,200	(1,200)	-22.2%
Misc. Fabricated Metal Prods	5,500	4,000	(1,500)	-27.3%
Heating Equip Screw Mach Prd & Containers	3,600	2,900	(700)	-19.4%
Industrial & Commerical Machinery	76,200	66,700	(9,500)	-12.5%
Engines & Turbines & Construction Machine	2,600	2,200	(400)	-15.4%
Metalworking Machinery	9,200	7,200	(2,000)	-21.7%
Special Industry Machinery	8,900	6,200	(2,700)	-30.3%
General Industrial Machinery	6,000	5,400	(600)	-10.0%
Computers	39,600	35,600	(4,000)	-10.1%
Refrigeration Machinery	1,800	2,000	200	11.1%
Industrial Machinery, n.e.c.	8,100	8,100	0	0.0%
Electronic & other Electrical Equipment	68,500	65,500	(3,000)	-4.4%
Electric Distributing Equipment	2,500	1,600	(900)	-36.0%
Electrical Industrial Apparatus	5,100	4,000	(1,100)	-21.6%
Electric Lighting & Wiring	5,300	5,400	100	1.9%
Household Audio & Video Equip & Appliance	2,800	2,300	(500)	-17.9%
Communications Equipment	18,400	16,600	(1,800)	-9.8%
Electronic Components	30,400	31,800	1,400	4.6%
Misc. Electrical Equipment	4,000	3,800	(200)	-5.0%
Transportation Equipment	25,600	20,800	(4,800)	-18.8%
Aircraft	8,500	6,700	(1,800)	-21.2%

Massachusetts Industry Employment Projections : 1991-2005

Industry	Employment 1991	Employment 2005	Net Change	Percent Change
Guided Missiles	15,800	12,700	(3,100)	-19.6%
Motor Vehicles & Ships	1,300	1,400	100	7.7%
Instruments & Related Products	65,800	60,300	(5,500)	-8.4%
Search & Navigational Instruments	15,700	13,900	(1,800)	-11.5%
Measuring & Controlling Instruments	24,700	21,100	(3,600)	-14.6%
Medical Instruments	13,500	16,700	3,200	23.7%
Ophthalmic Goods	2,700	1,900	(800)	-29.6%
Photographic Equipment & Supplies	9,200	6,700	(2,500)	-27.2%
Misc. Manufacturing	16,400	14,600	(1,800)	-11.0%
Jewelry, Silverware, Plated Ware	5,700	5,200	(500)	-8.8%
Toys and Sporting Goods	6,100	5,500	(600)	-9.8%
Manufactuirng, n.e.c.	4,600	3,900	(700)	-15.2%
Nondurable Goods	168,300	145,500	(22,800)	-13.5%
Food and Kindred Products	19,500	13,800	(5,700)	-29.2%
Textiles Mill Products	13,900	9,200	(4,700)	-33.8%
Apparel & other Finished Products	17,500	10,300	(7,200)	-41.1%
Paper and Related Products	21,000	18,200	(2,800)	-13.3%
Printing & Publishing	49,500	55,000	5,500	11.1%
Chemicals & Related Products	17,500	17,800	300	1.7%
Industrial Inorganic Chemicals	2,100	1,800	(300)	-14.3%
Plastics Materials & Synthetic Resins	4,600	4,700	100	2.2%
Drugs	3,600	3,800	200	5.6%
Soaps & Paints	3,900	3,800	(100)	-2.6%
Miscellaneous Chemicals	3,300	3,700	400	12.1%
Petroleum Refining	1,300	1,200	(100)	-7.7%
Rubber & Misc. Plastics Products	22,000	16,900	(5,100)	-23.2%
Rubber & Plastics Footwear	5,300	3,400	(1,900)	-35.8%
Misc. Plastics Products	16,700	13,500	(3,200)	-19.2%
Leather & Leather Products	6,100	3,100	(3,000)	-49.2%

Technical Notes

The Data

The historical data used in the projections are based on employment data collected by the Massachusetts Department of Employment and Training under a Federal-State cooperative agreement with the U.S. Department of Labor, Bureau of Labor Statistics (BLS). Workers holding two or more jobs are counted at each establishment.

Industry Classification

Industries are defined according to the Standard Industrial Classification (SIC) system. This coding system divides the business activities of all firms into broad groups---service-producing or goods-producing sectors. These two sectors can be separated further into industry divisions such as services and manufacturing, groups of industries, and individual industries. A detailed description of SIC definitions is contained in the 1987 Standard Industrial Classification Manual.

The Projections Framework

The specific economic forecasting models used by DET generally followed a standard economic "export-base" approach. Certain industries are considered "basic" if the output they produce is not entirely consumed locally, but exported out of the state for national or international consumption. This assumption allows these industries to be linked closely to the national economy, and hence follow national trends in productivity and output growth. Typical examples of "basic" industries in Massachusetts are computer equipment and software industries and colleges and universities. In contrast "nonbasic" industries are those such as retail trade and transportation, communications and utilities whose output is consumed locally. Growth of "nonbasic" industries depends largely on the growth of the "basic" sectors that form the basis of the Massachusetts economy.

Employment in "basic" industries is assumed theoretically to be a function of product demand and the price of labor. BLS's national 2005 industry employment served as the principal explanatory variable for demand for industry output at the national level. BLS's national industry projections take into account the estimated impact of changes in employment demand due to shifts in the relative prices of capital and labor.

Employment in some "basic" industries may vary from national trends, depending on local economic growth rates, production costs, and the relative age mix of plant and equipment. Explanatory variables included to capture this differential economic growth were Massachusetts' share of national population, income, total employment and manufacturing employment. An industry in Massachusetts may also vary from U.S. business cycles in the severity, timing of turning points, and recovery. The national unemployment rate and percent change in Gross National Product, current and lagged one period, are potential determinants used to detect such effects.

Employment in local serving industries is primarily based on demand by the state's residents rather than on national economic conditions. Local population, income, and employment are prime measures of local product demand. Jobs in local service industries may also be affected by cyclical fluctations in the state's export or "basic" industries and local business conditions. The explanatory variables used to capture this differential were the same ones used for the export industries (see above).

DET obtained U.S. employment projections from the U.S. Department of Labor Bureau of Labor Statistics,[1] state population projections from the U.S Department of Commerce, Bureau of the Census and income projections prepared by the U.S. Department of Commerce, Bureau of Economic Analysis. D.E.T also sought comments, opinions and projections from other industry groups and leaders.

A panel of in-house economists and analysts throughly reviewed these estimates for reasonableness and consistency and revised these projections when appropriate. The projections published here represent the final judgment of the Department of Employment and Training.

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1 *these projections are from the moderate trend scenario which is published in detail in the 1991 November Monthly Labor Review, issued by the BLS.*

The Department of Employment and Training--Making a Difference in Massachusetts

The Department of Employment and Training (D.E.T.) combines unemployment insurance, employment and training services research, and employer revenue collection in one agency. With 2,000 employees in more than 40 offices statewide, D.E.T.'s top priority is to serve the employment needs of the Massachusetts business community, and the people they employ.

The D.E.T. Research Department is the state's single most important source for federal, state and local economic and labor market information. Labor market analysts and economists produce employment and unemployment data, analyze economic trends and compile industry and occupational projections.

Massachusetts Industry Projections is one of many publications developed by the D.E.T. Research Department to communicate important economic information to Massachusetts' job seekers, job counselors, employers and others concerned with labor market issues.

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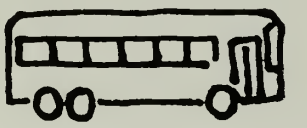

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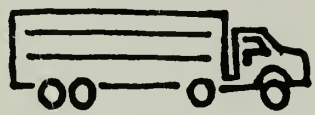

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